SEQUENCE LISTING

<110> Gutteridge, Steve
Harvell, Leslie T.
Orozco, Buddy

<120> Plant Genes Encoding Pantothenate Synthetase

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35 40 45

Ser Leu Ile Ser Ala Ala Val Ala Ala Ser Ala Gly Pro Ile Ala Val
50 55 60

Val Val Ser Ile Tyr Val Asn Pro Ser Gln Phe Ala Pro Thr Glu Asp
65 70 75 80

Leu Ala Thr Tyr Pro Ser Asp Phe Ala Gly Asp Leu Arg Lys Leu Ala
85 90 95

Ala Thr Gly Val Val Ala Ala Val Phe Cys Pro Pro Asp Leu Tyr Val
100 105 110

Arg Gly Ser Ala Asp Arg Pro Ser Ala Ala Gly Ala Ser Gly Gly Ala
115 120 125

Val Ser Cys Leu Glu Asp Ala Gly Gly His Ala His Glu Thr Trp Ile
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Arg Val Glu Arg Leu Glu Lys Gly Leu Cys Gly Ser Ser Arg Pro Val
145 150 155 160

Phe Phe Arg Gly Val Ala Thr Val Val Ala Lys Leu Phe Asn Ile Val
165 170 175

Glu Pro Asp Val Ala Val Phe Gly Lys Lys Asp Tyr Gln Gln Trp Arg
180 185 190

Val Ile Cys Arg Met Val Arg Asp Leu Asp Phe Ala Ile Gln Ile Val
195 200 205

Gly Ser Glu Val Val Arg Glu Ala Asp Gly Leu Ala Met Ser Ser Arg
210 215 220

Asn Val Asn Leu Ser Glu Glu Asp Arg Lys Lys Ala Leu Ser Ile Ser
225 230 235 240

Arg Ser Leu Val Asp Ala Arg Thr Ala Ala Leu Ser Gly Ser Asn Arg
245 250 255

Ser Gln Glu Ile Lys Asp Gln Ile Val Arg Thr Ile Thr Glu Ala Gly
260 265 270

Gly Gln Val Asp Tyr Val Glu Ile Val Gly Gln Glu Ser Leu Val Pro
275 280 285

Val Glu Arg Met Asp Arg Pro Cys Val Ile Cys Val Ala Ala Trp Phe
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Thr Val Leu Ser Ile
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35 40 45

Val Ser Ala Ala Val Ala Ala Ser Ala Gly Pro Val Ala Val Val Val
50 55 60

Ser Ile Tyr Val Asn Pro Ser Gln Phe Ala Pro Thr Glu Asp Leu Ala
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Thr Tyr Pro Ser Asp Phe Ala Gly Asp Leu Gly Lys Leu Ala Ala Thr
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Gly Val Val Ala Ala Val Phe Cys Pro Pro Asp Leu Tyr Val Arg Gly
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Ser Ala Asp Arg Pro Ser Ala Ala Ser Ala Ser Gly Gly Ala Val Ser
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Cys Leu Glu Asp Ala Gly Gly His Ala His Glu Thr Trp Ile Arg Val
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Glu Arg Leu Glu Lys Gly Leu Cys Gly Ser Ser Arg Pro Val Phe Phe
145 150 155 160

Arg Gly Val Ala Thr Val Val Ala Lys Leu Phe Asn Ile Val Glu Pro
165 170 175

Asp Val Ala Val Phe Gly Lys Lys Asp Tyr Gln Gln Trp Arg Val Ile
180 185 190

Cys Arg Met Val Arg Asp Leu Asp Phe Ala Ile Gln Ile Val Gly Ser
195 200 205

Glu Val Val Arg Glu Ala Asp Gly Leu Ala Met Ser Ser Arg Asn Val
210 215 220

Asn Leu Ser Glu Glu Asp Arg Lys Lys Ala Leu Ser Ile Ser Arg Ser
225 230 235 240

Leu Val Asp Ala Arg Thr Ala Thr Leu Ser Gly Ser Asn Arg Ser Gln
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Glu Ile Lys Asp Gln Ile Val Arg Thr Ile Thr Glu Ala Gly Gly Gln
260 265 270

Val Asp Tyr Val Glu Ile Val Glu Gln Glu Ser Leu Val Pro Val Glu
275 280 285

Arg Met Asp Arg Pro Cys Val Ile Cys Val Ala Ala Trp Phe Gly Lys
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Leu Ser Ile
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<213> Eucalyptus grandis

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Leu Val Pro Thr Met Gly Phe Leu His Glu Gly His Leu Ser Leu Val
         35                  40                  45

Arg Glu Ala Arg Arg Arg Ala Asp Ala Val Val Val Ser Val Tyr Val
     50                  55                  60

Asn Pro Gly Gln Phe Ala Pro Ser Glu Asp Leu Ser Thr Tyr Pro Ser
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Asp Phe Glu Gly Asp Leu Gly Lys Leu Arg Ala Val Pro Gly Gly Val
                 85                  90                  95

Asp Val Val Phe Arg Pro Gln Asn Leu Tyr Asp Tyr Gly Gln Arg Glu
            100                 105                 110

Val Gly Gly Ser Gly Val Glu Ser Asp Asn Gly Ser Val Ser Cys Leu
        115                 120                 125

Glu Glu Lys Gly Met Gly His Glu Ala Trp Val Arg Val Glu Arg Leu
    130                 135                 140

Glu Lys Gly Met Cys Gly Lys Ser Arg Pro Val Phe Phe Arg Gly Val
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Ala Thr Val Val Thr Lys Leu Phe Asn Ile Val Glu Pro Asp Val Ser
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Val Phe Gly Lys Lys Asp Tyr Gln Gln Trp Arg Ile Ile Arg Arg Leu
            180                 185                 190

Val Asn Leu Asp Phe Ser Ile Gln Val Ile Gly Ser Glu Val Met Arg
        195                 200                 205

Asp His Asp Gly Leu Ala Leu Ser Ser Arg Asn Val His Leu Ser Pro
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Glu Glu Arg Glu Lys Ala Leu Ser Ile Ser Arg Ser Leu Ser Arg Ala
225                 230                 235                 240

Lys Ser Ala Ala Glu Lys Gly Gln Val Asn Cys Gln Asn Leu Lys Asp
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Ser Val Ile Gln Ala Ile Gln Glu Ala Gly Gly Lys Ile Asp Tyr Ala
            260                 265                 270

Glu Ile Val Asp Gln Glu Ser Leu Glu Ala Val Glu Glu Ile Arg Ser
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Pro Val Val Ser Cys Val Ala Ala Trp Phe Gly Lys Val Arg Leu Ile
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<212> PRT
<213> Glycine max

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35 40 45

Arg Gln Leu Ser Asp Val Val Ala Val Ser Ile Tyr Val Asn Pro Gly
50 55 60

Gln Phe Ala Pro Thr Glu Asp Leu Ser Thr Tyr Pro Ser Asp Phe Asp
65 70 75 80

Gly Asp Val Lys Lys Leu Ala Ser Val Pro Gly Gly Val Asp Val Val
85 90 95

Phe His Pro Arg Asn Leu Tyr Asp Tyr Gly Lys Asn Gly Gly Gly Asp
100 105 110

Val Ala Glu Ala Gly Gly Met Val Ser Cys Val Glu Ser Gly Ser Gly
115 120 125

His Glu Ser Trp Val Arg Val Glu Lys Leu Glu Leu Gly Leu Cys Gly
130 135 140

Lys Ser Arg Pro Val Phe Phe Arg Gly Val Ala Thr Val Val Thr Lys
145 150 155 160

Leu Phe Asn Ile Val Glu Pro Asp Val Ala Val Phe Gly Lys Lys Asp
165 170 175

Tyr Gln Gln Trp Arg Leu Ile Gln Arg Met Val Arg Asp Leu Asp Phe
180 185 190

Ser Ile Lys Val Ile Gly Ala Glu Ile Thr Arg Asp Asn Asp Gly Leu
195 200 205

Ala Met Ser Ser Arg Asn Val His Leu Ser Pro Glu Glu Arg Glu Lys
210 215 220

Ala Leu Ser Ile Asn Lys Ser Leu Leu Arg Ala Lys Ser Ala Ala Gly
225 230 235 240

Asp Gly Gln Val His Cys Glu Lys Leu Thr Asn Leu Val Ile Gln Ser
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Val Thr Asp Ala Gly Gly Arg Ile Asp Tyr Ala Glu Ile Val Asp Gln
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Asn Asn Leu Glu Lys Val Glu Gln Ile Lys Ser Pro Val Val Phe Cys
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<213> Tulipa fosteriana

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Asn	Pro	Tyr	Ala	Asp	Gly	His	Glu	Thr	Trp	Val	Arg	Val	Glu	Glu	Leu
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Glu	Arg	Gly	Leu	Cys	Gly	Leu	Ser	Arg	Pro	Val	Phe	Phe	Arg	Gly	Val
	130					135					140				
Ala	Thr	Val	Val	Ser	Lys	Leu	Phe	His	Leu	Val	Glu	Pro	Asp	Val	Ala
145					150					155					160
Val	Phe	Gly	Lys	Lys	Asp	Phe	Gln	Gln	Trp	Arg	Val	Ile	Glu	Lys	Met
				165					170					175	
Val	Arg	Asp	Leu	Asp	Phe	Pro	Val	Arg	Ile	Val	Gly	Ser	Glu	Ile	Val
			180					185					190		
Arg	Glu	Val	Asp	Gly	Leu	Ala	Met	Ser	Ser	Arg	Asn	Val	Arg	Leu	Thr
		195					200					205			
Pro	Glu	Glu	Arg	Glu	Lys	Ala	Leu	Ser	Ile	Ser	Arg	Ser	Leu	Ser	Arg
	210					215					220				
Ala	Lys	Val	Ala	Ala	Gln	Asn	Gly	Ser	Ser	Ser	Cys	Gln	Glu	Leu	Lys
225					230					235					240

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Asp Ile Ala Thr Gln Ser Ile Thr Glu Ala Gly Gly Arg Ile Asp Tyr
                245                 250                 255

Val Glu Ile Val Asp Gln Glu Ser Leu Lys Val Val Leu Asp Ile Thr
            260                 265                 270

Ser Pro Val Val Met Cys Ile Ala Ala Trp Phe Gly Asn Val Arg Leu
        275                 280                 285

Ile Asp Asn Met Glu Ile Thr Ile
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<212> DNA
<213> Triticum aestivum

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gagcaggaaa gtttggtacc tgtggagacg atcgaccgcc ctgttgtcat ttgtgtcgcc 960
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<213> Triticum aestivum

<400> 13
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Arg Ala Trp Ser Arg Arg Gln Arg Ala Glu Gly Lys Thr Val Val Leu
            20                  25                  30

Val Pro Thr Met Gly Phe Leu His Glu Gly His Leu Ser Leu Val Ser
        35                  40                  45

Ala Ala Ala Ala Val Pro Gly Pro Val Ala Val Val Val Ser Ile Tyr
    50                  55                  60
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Val Asn Pro Ser Gln Phe Ala Pro Thr Glu Asp Leu Ala Thr Tyr Pro
65 70 75 80

Ser Asp Leu Ala Gly Asp Leu Arg Lys Leu Ala Ser Thr Gly Ala Val
85 90 95

His Ala Val Phe Asn Pro Pro Asp Leu Tyr His Arg Gly Ala Ala Val
100 105 110

Ser Gly Arg Arg Ala Glu Ala Pro Ala Gly Ala Ala Ala Ser Ser Cys
115 120 125

Leu Glu Ala Gly Gly Asp Gly His Glu Thr Trp Ile Arg Val Glu Arg
130 135 140

Leu Glu Lys Gly Leu Cys Gly Ala Ser Arg Pro Val Phe Phe Arg Gly
145 150 155 160

Val Ala Thr Val Val Ala Lys Leu Phe Asn Val Val Glu Pro Asp Val
165 170 175

Ala Met Phe Gly Lys Lys Asp Tyr Gln Gln Trp Arg Leu Ile Cys Arg
180 185 190

Met Val Arg Asp Leu Asp Phe Ala Val Glu Ile Ile Gly Ala Glu Ile
195 200 205

Val Arg Glu Ala Asp Gly Leu Ala Met Ser Ser Arg Asn Val His Leu
210 215 220

Ser Pro Glu Glu Arg Glu Lys Ala Leu Ser Ile Ser Arg Ser Leu Leu
225 230 235 240

Asn Ala Arg Thr Ala Ala Leu Asn Asn Ser Asn Ser Ala Ser Glu His
245 250 255

Ile Lys Asp Gln Ile Val Gln Thr Leu Thr Glu Ala Gly Gly Arg Val
260 265 270

Asp Tyr Val Glu Ile Val Glu Gln Glu Ser Leu Val Pro Val Glu Thr
275 280 285

Ile Asp Arg Pro Val Val Ile Cys Val Ala Ala Trp Phe Gly Lys Val
290 295 300

Arg Leu Ile Asp Asn Ile Glu Ile His Ile Gln Ser
305 310 315

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<211> 313
<212> PRT
<213> Oryza sativa

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Val Pro Thr Met Gly Tyr Leu His Gln Gly His Leu Ser Leu Ile Ser
35 40 45

Ala Ala Ala Ala Ala Ala Ser Ala Asp Pro Val Ala Ile Val Val Thr
50 55 60

Ile Tyr Val Asn Pro Ser Gln Phe Ala Pro Ser Glu Asp Leu Ala Thr
65 70 75 80

Tyr Pro Ser Asp Phe Ala Gly Asp Leu Arg Lys Leu Ala Ser Thr Gly
85 90 95

Val Val Asp Ala Val Phe Asn Pro Pro Asp Leu Tyr Val Arg Gly Ala
100 105 110

Gly Arg Arg Gly Ala Gly Ser Gly Gly Ala Ile Ser Cys Leu Glu Glu
115 120 125

Ala Ala Gly Asp Gly His Glu Thr Trp Val Arg Val Glu Arg Leu Glu
130 135 140

Lys Gly Leu Cys Gly Ala Ser Arg Pro Val Phe Phe Arg Gly Val Ala
145 150 155 160

Thr Ile Val Ser Lys Leu Phe Asn Ile Ile Glu Pro Asp Val Pro Val
165 170 175

Phe Gly Lys Lys Asp Tyr Gln Gln Trp Arg Val Ile Leu Pro Tyr Trp
180 185 190

Ser Gly Leu Asp Phe Gly Ile Glu Ile Met Gly Ser Arg Asn Cys Ala
195 200 205

Arg Thr Asp Gly Leu Ala Met Asn Ser Arg Asn Val His Leu Ser Arg
210 215 220

Glu Glu Gly Lys Lys Ala Leu Ser Ile Ser Arg Ser Leu Val Asp Ala
225 230 235 240

Arg Thr Gly Ala Leu Lys Gly Asn Thr Asp Ser Lys Gln Ile Lys Asn
245 250 255

Lys Ile Val Gln Thr Leu Thr Glu Thr Gly Gly Gln Val Asp Tyr Val
260 265 270

Glu Ile Val Glu Gln Glu Ser Leu Val Pro Val Glu Gln Ile Asp Gly
275 280 285

Pro Val Val Ile Cys Val Ala Ala Trp Phe Gly Lys Val Arg Leu Ile
290 295 300

Asp Asn Ile Glu Ile Asp Thr Arg Ser
305 310

<210> 15
<211> 308
<212> PRT
<213> Lotus japonicus

<400> 15

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Arg Ser Met Arg Ser Gln Gly Lys Leu Ile Ala Leu Val Pro Thr Met
            20                  25                  30

Gly Phe Leu His Glu Gly His Leu Ser Leu Val Arg Asp Ala His Asn
        35                  40                  45

His Ala Asp Leu Val Ala Val Ser Ile Tyr Val Asn Pro Gly Gln Phe
    50                  55                  60

Ser Pro Thr Glu Asp Leu Ser Ala Tyr Pro Ser Asp Phe Gln Gly Asp
65                  70                  75                  80

Leu Gln Lys Leu Met Ser Val Pro Gly Gly Val Asp Val Val Phe His
                85                  90                  95

Pro His Asn Leu Tyr Asp Tyr Gly Gly Asp Gly Gly Asp Ala Val Ala
            100                 105                 110

Glu Cys Gly Gly Asp Gly Val Val Ser Cys Val Asp Arg Arg Ser Gly
        115                 120                 125

Phe Gly His Glu Thr Trp Val Arg Ala Glu Lys Leu Glu Lys Pro Leu
    130                 135                 140

Cys Gly Lys Ser Arg Pro Val Phe Phe Arg Gly Val Ala Thr Ile Val
145                 150                 155                 160

Thr Lys Leu Phe Asn Ile Val Glu Pro Asp Val Ala Val Phe Gly Lys
                165                 170                 175

Lys Asp Tyr Gln Gln Trp Lys Ile Ile Gln Arg Met Val Arg Asp Leu
            180                 185                 190

Asp Phe Ser Ile Lys Val Ile Gly Ser Glu Val Ile Arg Glu Lys Asp
        195                 200                 205

Gly Leu Ala Met Ser Ser Arg Asn Val Tyr Leu Ser Pro Glu Glu Arg
    210                 215                 220

Glu Lys Ala Val Ser Ile Asn Lys Ser Leu Phe Arg Ala Lys Ser Ala
225                 230                 235                 240

Ala Glu Asp Gly Gln Ile His Cys Glu Lys Leu Ile Asn Leu Val Val
                245                 250                 255

Gln Ser Ile Thr Glu Ala Gly Gly Arg Ile Asp Tyr Ala Glu Ile Val
            260                 265                 270

Asp Gln Asn Asn Leu Glu Lys Val Glu Trp Ile Lys Gly Pro Val Val
        275                 280                 285

Phe Cys Val Ser Ala Trp Phe Gly Lys Ala Arg Leu Ile Asp Asn Ile
    290                 295                 300
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Glu Ile Asn Leu
305